

## **REMARKS**

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 47, 52, 53, 55, 58, 65 and 69 are currently being amended. Applicant respectfully requests entry of these amendments to place application in better condition for appeal.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier. After amending the claims as set forth above, claims 47-78 are now pending in this application.

## **Drawings**

On page 2 of the Office Action dated November 21, 2007, the Examiner indicated that the drawings submitted on June 20, 2006 are not accepted. The Examiner restated the objection that reference characters 720 and 705 still are both used to designate the same element in Figure 8. The Applicant addressed this objection in a previous response, stating that in the amended figured submitted, Fig. 8 was amended such that the arrow associated with reference numeral 720 more clearly points to the element associated with the reference numeral. In particular, **the arrow point directly rests on the edge of the laser light source 720** including first layer 730, second layer 740, and doped junction 750. The Applicant respectfully requests that the Examiner explain why an arrow with its point resting directly on the edge of its corresponding element that is composed of other (also clearly labeled) elements is objectionable.

## **Claim Objections**

On page 3 of the Office Action, claims 47, 55, 65 and 69 were objected to for using the phrase “the periphery being a single, outer periphery.” This phrase has been removed from claims 47, 55, 65 and 69.



**Claim Rejections under 35 USC 103**

On page 3 of the Office Action dated November 21, 2007, claims 47-58 and 63-78 were rejected under 35 USC 103(a) as being unpatentable over US Patent No. 5,233,205 (Usagawa). Applicants have amended claims 47, 55, 65 and 69, rendering the rejection moot. Further, Usagawa does not describe Applicants' claimed invention as recited in claims 47-58 and 63-78.

Claim 1, as amended, requires, *inter alia*:

An optical logic circuit performing an **inversion function** ...

the interference region comprises the second material and is bounded on all sides by material other than the second material except where the first and second optical inputs and optical output are located, **wherein the interference region is a uniform three dimensional region and contains no potential barriers partitioning the interference region** between the optical inputs and the optical output...

(emphasis added). Claims 47, 55, 65 and 69 have substantially similar limitations which are not found Usagawa.

With respect to Usagawa, the inverter disclosed (see Fig. 1D) requires a potential barrier (2) used to partition the pathways 104 and 105. (Col. 8, lines 15-31). More specifically, column 8 lines 26-31 of Usagawa states that "the arrangement, size, shape, and height of the potential barrier 2 and the electron wave paths 104, 105, 103 may be appropriately designed so that the input electron wave X and the reference input wave may offset each other with the phases thereof displaced by  $\pi$  from each other." These barriers are required by the structure in Usagawa. Claims 47, 55, 65 and 69, as amended, specifically exclude these types of partitions in the interference regions. Claims 48-54 depend from claim 47, claims 56-58 and 63-64 depend from claim 55, claims 66-68 depend from claim 65 and claims 70-78 depend from claim 69.

Thus, Usagawa does not disclose, teach or suggest "performing and inversion function . . . wherein the interference region is a uniform three dimensional region and contains no potential



barriers partitioning the interference region,” as recited in claims 47, 55, 65 and 69, as amended. Thus the rejection of claims 47-58 and 63-78 under 35 USC 103 cannot be properly maintained.

On page 7 of the Office Action, claims 59-62 were rejected under 35 USC 103(a) as being unpatentable over Usagawa as applied to claim 55 above, and further in view of US Patent No. 3,837,728 (Logan). Claims 59-62 depend from claim 55 and are allowable over Usagawa for at least the same reasons described above with respect to claim 55.

On page 7 of the Office Action, claims 47-58 and 63-78 were rejected under 35 USC 103(a) as being unpatentable over US Patent No. 4,128,300 (Stotts) in view of US Patent No. 5,315,422 (Utaka). Applicants have amended claims 47, 55, 65 and 69, rendering the rejection moot. Further, Utaka does not describe Applicants’ claimed invention as recited in claims 47-58 and 63-78.

Claim 1, as amended, requires, *inter alia*:

An optical logic circuit performing an **inversion function** ...

the interference region comprises the second material and is bounded on all sides by material other than the second material except where the first and second optical inputs and optical output are located, **wherein the interference region is a uniform three dimensional region and contains no potential barriers partitioning the interference region** between the optical inputs and the optical output...

(emphasis added). Claims 47, 55, 65 and 69 have substantially similar limitations which are not found Stotts.

With respect to Stotts, Stotts does not disclose performing an inversion function as recited in claims 47, 55, 65 and 69. Furthermore, Stotts discloses a partition (22) as shown in Figures 1-3 which are required for Stotts to operate. The partition isolates the different pathways of the of an input signal (11) so that other input signals on (18) and (19) in Figure 1 can alter the electromagnetic field across (23) and (24), which in turn, alters the signals in the pathways



receiving the input signal (11). The partition (22) is required by the structure in Stotts. Claims 47, 55, 65 and 69, as amended, specifically exclude these types of partitions in the interference regions. Claims 48-54 depend from claim 47, claims 56-58 and 63-64 depend from claim 55, claims 66-68 depend from claim 65 and claims 70-78 depend from claim 69.

Thus, Stotts does not disclose, teach or suggest “performing and inversion function . . . wherein the interference region is a uniform three dimensional region and contains no potential barriers partitioning the interference region,” as recited in claims 47, 55, 65 and 69, as amended. Utaka does not cure these deficiencies. Thus the rejection of claims 47-58 and 63-78 under 35 USC 103 cannot be properly maintained.

On page 9 of the Office Action, claims 59-62 were rejected under 35 USC 103(a) as being unpatentable over Stotts and Utaka as applied to claim 55 above, and further in view of Logan. Claims 59-62 depend from claim 55 and are allowable over Stotts for at least the same reasons described above with respect to claim 55.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37



C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 1/22/2008

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